Defining Existing Uses, Defining & Characterizing Existing Water Quality

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DEFINING EXISTING USES

Existing uses are defined by EPA as, "those uses actually attained in the waterbody on or after November 28, 1975, whether or not they are included in the water quality standards.'' (40 CFR 131.3(e)). EPA's *Water Quality Standards Handbook* (1994) notes that an existing use

> can be established by demonstrating that: fishing, swimming, or other uses have actually occurred since November 28, 1975; or that the water quality is suitable to allow the use to be attained—unless there are physical problems, such as substrate or flow, that prevent the use from being attained. An example of the latter is an area where shellfish are propagating and surviving in a biologically suitable habitat and are available and suitable for harvesting although, to date, no one has attempted to harvest them. Such facts clearly establish that shellfish harvesting is an "existing" use, not one dependent on improvements in water quality. To argue otherwise would be to say that the only time an aquatic protection use "exists" is if someone succeeds in catching fish.

EPA interprets the definition above to mean that "no activity is allowable under the antidegradation policy which would partially or completely eliminate any existing use whether or not that use is designated in a State's water quality standards." The *Water Quality Standards Handbook* further states that

> The aquatic protection use is a broad category requiring further explanation. Non-aberrational species must be protected, even if not prevalent in number or importance. Water quality should be such that it results in no mortality and no significant growth or reproductive impairment of resident species. Any lowering of water quality below this full level of protection is not allowed.

DEFINING AND CHARACTERIZING EXISTING WATER QUALITY

Clearly, the establishment of existing water quality is necessary—not only for antidegradation reviews, but for other purposes as well (e.g., CWA section 305(b) reporting). Accurately describing existing water quality on a regular basis, however, is no simple matter. Monitoring and assessment are resource-intensive—time, money, and materials are required. Moreover, it is generally accepted that existing water quality is not static. Water quality might improve or degrade over time, affecting the waterbody's status (e.g., unimpaired, impaired) and any antidegradation review conducted for a proposed activity during a particular time period. EPA has issued considerable guidance for describing existing water quality (e.g., CWA section 305(b) guidance) in terms of both numeric and narrative parameters.

The fairly strong EPA endorsement of a parameter-by-parameter approach for antidegradation reviews on the basis of an analysis of available assimilative capacity for the pollutant(s) of concern in the proposed discharge assumes that data on the receiving waterbody (i.e., baseline or existing water quality data) has been collected. In an August 2005 memorandum to regional water management division directors on *Tier 2 Antidegradation Reviews and Significance Thresholds,* EPA's OST Director, Ephraim S. King, noted that, "it is important to clarify that the most appropriate way to define a significance threshold is in terms of assimilative capacity. Other approaches for defining significance, such as considering only increases in pollutant loading, may not take into account the resulting changes in water quality, and in some cases may allow most or all of the remaining assimilative capacity of the waterbody to be used without an antidegradation review."

Several EPA regions have issued guidance on how to characterize existing (baseline) water quality for the purpose of antidegradation reviews. EPA's Region 9 antidegradation guidance recommends the following approach to determining existing water quality for the purpose of antidegradation reviews:

> First, the State should develop procedures to document the degree to which water quality exceeds that necessary to protect the uses. Ambient monitoring data can be used to provide this documentation. States must adopt procedures to assure that, where little or no data exists, adequate information will be available to determine the existing quality of the water body or bodies, which could be adversely affected by the proposed action. Such procedures should include both an assessment of existing water quality and a determination of which water quality parameters and beneficial uses are likely to be affected. These assessments and determinations could be performed either by the State or the party proposing the action in question.

In *Antidegradation Implementation* guidance, EPA Region 8 suggests that states focus on the pollutants of concern believed to be in the discharge and request that the applicant collect information wherever possible:

> Certainly, monitoring and assessing surface water quality is a difficult and ongoing task, and projecting the water quality that will result from proposed activities can be made difficult by the inherent complexity of receiving water systems. The critical issue becomes: How much information and analysis is needed to make the required antidegradation Tier 2 findings, and where information is lacking, who should be responsible for providing it?... EPA Region VIII believes that implementation of antidegradation Tier 2 requirements need not pose an undue burden on the state and tribal agencies charged with administering surface water quality programs. The model antidegradation procedure included in this guidance has been developed to allow states and tribes to focus resources on significant problems and issues and, where necessary, place the information-gathering burden on the project applicant...with respect to any data that may be needed to make the high quality and significance findings...

EPA Region 8 guidance further notes that "the applicant may be required to provide monitoring data or other information about the affected waterbody to help determine the applicability of (T)ier 2 requirements based on the high-quality test. The information that will be required in a given situation will be identified on a case-by-case basis.... Such information may include recent ambient chemical, physical, and biological monitoring data sufficient to characterize, during the appropriate critical condition(s), the existing uses and the spatial and temporal variability of existing quality of the segment for the parameters that would be affected by the proposed activity."

Some states have also provided detailed guidance on characterizing baseline water quality. California's implementation document describes baseline water quality as the best quality that has occurred since 1968 (date of the policy adoption) unless, permitted degradation has occurred (i.e., been subject to antidegradation review). If permitted degradation has occurred, existing water quality is the quality attained at the time of the permitted action. West Virginia codified its approach for determining baseline water quality at 60 CSR 05, placing the burden of gathering information on existing water quality squarely on the applicant if data are not available, while allowing *the public* or *any other source* to submit assessment information "as long as the data are recent and reliable."

> Where baseline water quality has not been established for the water segment the regulated entity proposes to impact or has not been established for a parameter of concern that is reasonably expected to be discharged into the water segment as a result of the proposed regulated activity, the Secretary must determine the baseline water quality for the receiving water body. The Secretary may consider data for establishing the baseline water quality from a federal or state agency, the regulated entity, the public, or any other source, as long as the data are recent and reliable. If adequate data are not available, the agency may, in conjunction with the regulated entity or on its own initiative, establish a plan for obtaining the necessary data. The regulated entity may be required to provide baseline water quality for those parameters of concern that are reasonably expected to be discharged as a result of the regulated activity into the affected water segment to help the permitting agency determine the baseline water quality, the existing uses, and the applicable tier. The regulated entity may contact the Secretary prior to initiating a baseline water quality evaluation to seek

> concurrence with its determination of the parameters of concern for its proposed activity and its proposed sampling protocol.

Missouri also takes this approach in establishing what it calls *existing water quality* or EWQ. The first EWQ establishes the benchmark. All subsequent dischargers must use the same EWQ data to determine the 10 percent threshold for an antidegradation review. The Colorado Water Quality Control Division (WQCD) took a slightly different approach, deciding to set baseline water quality for all waters in the state as that water quality which existed on a certain date. In 2001 the Colorado WQCD selected September 30, 2000, as the baseline date for water quality for all regulatory purposes by stating that "the baseline low-flow pollutant concentration shall represent the water quality as of September 30, 2000. The baseline low-flow pollutant concentration is a characterization of water quality conditions that existed at the time of this regulation change." Colorado characterizes ambient conditions by the 85th percentile of representative data. Because concentrations generally have an inverse relationship to flow (lower flows have higher concentrations), the 85th percentile is more representative of lower flow conditions and serves as the representation of baseline low-flow pollutant concentration. If sufficient representative low flow data are available, the 50th percentile of this low flow data may be used to characterize baseline conditions. Colorado regulations specify that existing water quality "shall be the 85th percentile of the data for un-ionized ammonia, nitrate, and dissolved metals, the 50th percentile for total recoverable metals, the 15th percentile for dissolved oxygen, the geometric mean for fecal coliform and *E. coli*, and the range between the 15th and 85th percentiles for pH."

Nevada uses a somewhat similar approach for establishing baseline water quality but has not established a specific date on which existing water quality is based. Under the Nevada approach, a requirement to maintain existing higher quality or RMHQ is established when the monitoring data show that existing water quality for individual parameters is significantly better than the standard necessary to protect the beneficial uses. If adequate monitoring data exist, RMHQs are established at levels that reflect existing conditions. RMHQs are generally established at the 95th percentile of data, which is defined as the 95th ranked value of a sample population distributed into one hundred equal parts. RMHQs are only proposed or revised if there is more than 5 years of data for single value RMHQs, or more than 10 years of data for annual average RMHQs, with a minimum of two samples per year. In cases where two or more monitoring sites exist for one reach, only the data from the most downstream site is considered. Tightening of RMHQs might be appropriate if there have been significant changes on the system, such as the removal of a major point source discharge, construction of a dam, and such. In general, if the percent improvement between the 95th percentile and the existing RMHQ is more than 25 percent, the RMHQ is revised.

South Carolina and other states define existing water quality as the water quality before the new or expanded discharge or project permit application. Under this approach, there is no set time or threshold on which existing or baseline water quality is based. This approach and others that do not establish firm baseline conditions can result in slowly deteriorating water quality, because incremental de minimis discharges slowly cause a lowering of water quality without an antidegradation review.

EPA's Great Lakes antidegradation guidance also discusses conducting reviews of potential degradation in terms that assume existing water quality data are known or will be collected. The guidance specifies that the level of protection afforded a waterbody under antidegradation will be determined on a parameter-by-parameter basis, considering each individual pollutant separately from the others present in a waterbody. EPA guidance notes that "under this approach, a discharger contemplating an action that would result in an increased loading would identify the constituents of its effluent that would increase as a result of the action. Then, *the ambient level of the pollutants of interest would be*

determined and compared to the applicable criteria. Where ambient concentrations of the pollutants in question are less than criteria concentrations, the waterbody would be considered high quality for those pollutants and increases in those pollutants would be subject to the requirements applicable to high quality waters." (Emphasis added.)

It should be noted that characterizing or otherwise describing baseline water quality for the purpose of antidegradation reviews is usually confined to an analysis of the pollutants of concern in the proposed discharge and not a comprehensive assessment of the full range of chemical, physical, and biological qualities of the receiving water. This approach somewhat limits a robust analysis of habitat degradation that might be associated with increased flows from stormwater runoff, a concept that has been incorporated into Minnesota's general NPDES permit for small MS4s.

Ohio Court Requires Protection of Existing Water Quality

In a 1992 decision in Columbus & Franklin County Metropolitan Park District et al., Appellees v. Shank, Director of Environmental Protection, et al., Appellants (Ohio, No. 91-1721), the Ohio Supreme Court ruled that state NPDES agencies must protect high quality (i.e., Tier 2) waters at their current levels unless antidegradation analytical and procedural requirements were fully met. The decision was related to the issuance of wastewater treatment plant permits to discharge into Blacklick Creek. Ohio EPA issued the permits based on their view that the discharges would not violate water quality standards. However, the Supreme Court found that the discharges would lower water quality, and noted that the Ohio EPA director "may not issue a permit authorizing an activity that would degrade waters which exceed water quality standards unless (1) he has complied with the public notice and intergovernmental coordination requirements of Parts 25 and 29, Title 40, C.F.R., (2) he has conducted a public hearing to consider the technical, economic and social criteria provided in Sections 1311 and 1312, Title 33, U.S. Code, and (3) as a result of the public hearing, he has chosen to allow lower water quality in the receiving stream. Where this determination has been made, the degradation of water quality must be kept to an absolute minimum by the employment of the most stringent statutory and regulatory controls for waste treatment and under no circumstances may such degradation interfere with or become injurious to any existing or planned uses of the receiving waters."

Responding to information from the agency and permittees that the wastewater plants would employ the highest levels of treatment and preserve existing uses of the receiving waters, the court further noted that "[e]ven where the prescribed technology is applied, a point source may not discharge effluent which would violate the applicable water quality standards. In the present case, the applicable water quality standard is the *current ambient condition* of Blacklick Creek inasmuch as the antidegradation policy establishes that quality as the benchmark." (Emphasis added.) In addition, the court emphasized the importance of the antidegradation review procedure and processes: "Limited degradation of high quality waters is permissible but only after compliance with the public hearing requirement of the rule and an administrative decision based thereon that technical, economic and social factors justify the degradation. Any economic and social analysis must consider alternative methods to accommodate the objectives of the proposed facility, the public and private investments in such alternatives and the governmental policy to promote them. If, after this analysis, the Director nevertheless concludes that technical, economic and social factors favor the proposed facility, the facility must incorporate the most stringent statutory and regulatory effluent controls, i.e., BADCT. Finally, this analysis must precede any consideration of an application for a permit to install a treatment facility."

Issue #2: Baseline Water Quality

Oklahoma (from Tt 2009 Report)
Oklahoma uses the waterbody-by-waterbody approach, and lists which waters are considered "high quality," i.e., those to be protected from new sources of degradation unless an alternatives analysis and socioeconomic justification is developed. The state reportedly has sufficient water quality data to determine baseline water quality for conducting antidegradation reviews – it does not accept data collected by volunteers but will consider those collected by public agencies. There is no allowance for de minimis levels of pollution from regulated activities discharging into Tier 2 waters.

South Carolina (from Tt 2009 Report)
South Carolina adopted the parameter-by-parameter approach, and considers baseline water quality for Tier 3 ONRWs and Tier 2.5 Outstanding Resource Waters (state ORWs) to be existing water quality as characterized at the time of waterbody classification. The state lists specific discharge types that are banned for ONRWs and ORWs, but allows those discharges upstream of protected waters if modeling indicates there will be no measurable impact within the ONRW and ORW segments downstream. South Carolina has strict policies regarding water quality data collection, monitoring, and assessment, and conducts probabilistic sampling to determine overall trends. The state lists specific options – including land application of the effluent – to be considered for alternatives analyses, which must be considered and documented by dischargers. CWA Section 208 area waste planning is still conducted in the state. Specific economic and social factors to be considered when proposing to degrade Tier 2 waters are listed.

Minnesota (from Tt 2009 Report)
Minnesota, a state that was sued for failing to apply antidegradation requirements to MS4 stormwater permits, uses the parameter-by-parameter approach. The state is currently revising and strengthening its stormwater rules to reflect current EPA recommendations and recent lawsuit rulings. The state assumes a waterbody is Tier 2 water by default, including impaired waters. Minnesota is including increased flow as a potentially degrading parameter under the new rules, since it can affect aquatic habitat. Baseline water quality information is collected by multiple entities, including state entities and dischargers, in some cases. Minnesota specifies use of the USACE CWA Section 404 permit "avoidance/minimization/mitigation" hierarchy in conducting antidegradation review alternatives analyses. Reviews are applied to general permits when they are developed and when they are applied to specific activities subject to permit coverage. Minnesota will adjust baseline water quality upward if there are improvements in water quality.

Kentucky (from Tt 2009 Report)
Information on Kentucky's program was provided by the attorney that successfully sued the state for failing to implement its antidegradation policies in accordance with EPA provisions. Kentucky also places most waters in the Tier 2 category, but does so under a waterbody-by-waterbody framework. The state does not include impaired waters in Tier 2 unless they're impaired for mercury – this ensures that state lakes are protected. Kentucky has undertaken efforts to develop antidegradation requirements for general permits, including stormwater and other general permits. Discussions are ongoing regarding the use of a de minimis standard for minor discharges and how to deal with the incremental loss of assimilative capacity due to multiple activities that cumulatively consume available assimilative capacity for pollutants of concern. Another issue is the protection of waterbody uses vs. the protection of numeric criteria only – i.e., there might be cases where uses are degraded significantly, but measurable changes in water quality criteria parameters might be minimal. In other cases, criteria limits might not adequately protect uses – this is more a uses/criteria issue than an antidegradation issue, but it does affect the antidegradation implementation approach.

Issue #2: Baseline Water Quality

Arizona (2008)

Federal and state law requires that surface waters be protected from discharges that might degrade water quality. To implement this requirement, it is necessary to identify antidegradation protection levels, or tiers, appropriate to each surface water. The state antidegradation rule, R18-11-107, delineates three tiers of protection for Arizona surface waters. These tiers are applied on a pollutant-by-pollutant basis. Under this approach, surface water quality might degrade for one or more pollutants of concern but be unaffected for other pollutants. Degradation may be further described as minimal (consumption of less than 20% of the assimilative capacity for a pollutant of concern) or significant (consumption of 20% or more of the assimilative capacity for a pollutant). Minimal degradation is permitted under the antidegradation rule and does not trigger comprehensive Tier 2 antidegradation review requirements. Significant degradation triggers the comprehensive Tier 2 antidegradation implementation procedures described below. The tiered protection levels are applied as follows:

> **Tier 1** –Applies to all surface waters as a minimum level of protection and requires that the level of water quality necessary for existing uses be maintained and protected. ADEQ interprets Tier 1 as requiring that water quality standards be achieved. Tier 1 prohibits further degradation of existing water quality where a pollutant of concern does not meet applicable water quality standards. Tier 1 applies as the default protection level for all surface waters, including intermittent waters, ephemeral waters, effluent dependent waters, canals, and impaired waters on the §303(d) list for the pollutants that resulted in the surface water being listed on the §303(d) list.
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> **Tier 2** – Applies to high quality, perennial surface waters, i.e., where existing water quality is better than applicable water quality standards. Tier 2 requires that existing high water quality be maintained, but allows limited degradation. Tier 2 prohibits significant degradation unless a review of reasonable alternatives and social and economic considerations justifies a lowering of water quality. Tier 2 is the default protection level for all perennial waters.
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> **Tier 3** – Applies only to Outstanding Arizona Waters identified in R18-11-112. Tier 3 prohibits any lowering of water quality in an Outstanding Arizona Water unless it is short-term, as determined by ADEQ on a case-by-case basis.

Where a perennial surface water is listed on the state's §303(d) impaired waters list for one or more pollutants, and where existing water quality for other parameters is better than water quality standards, the surface water will be afforded Tier 1 and Tier 2 protection on a pollutant-by-pollutant basis. That is, Tier 1 protection for the pollutants not meeting water quality standards and Tier 2 protection for pollutants that are equal to or better than water quality standards. Tier 3 protection will be afforded for all pollutants of concern in an Outstanding Arizona Water. **Where a perennial water has not been listed as an impaired water or as an Outstanding Arizona Water, the presumed antidegradation protection level is Tier 2 for all pollutants of concern.**

For Tier 2 protection, determinations regarding the significance of degradation are based on baseline water quality (BWQ) and the relative change in water quality projected to result from the discharge under review. In general, BWQ, as discussed in Chapter 4, defines existing water quality for purposes of antidegradation reviews. BWQ can be established for perennial surface waters through monitoring and water quality assessments conducted by ADEQ, regulated entities, or by others. It is important to note that BWQ for any surface

water may be re-evaluated if monitoring indicates a general trend towards water quality improvement.

It is important to understand that baseline water quality is fixed. When a perennial surface water is characterized for the purposes of establishing baseline water quality (BWQ), that characterization serves as the point of reference for future antidegradation reviews for that surface water unless BWQ is updated by ADEQ to reflect changes in water quality. The allowance for up to a 20 percent reduction in assimilative capacity for any pollutant of concern (i.e., "significant degradation) is calculated from BWQ at the time an application to discharge is submitted to ADEQ. Also, ADEQ has established a 50% cumulative cap on the consumption of assimilative capacity calculated from the time BWQ is determined originally. Any consumption of assimilative capacity greater than a 50% cumulative cap on the use of available assimilative capacity is considered to be significant degradation. If a regulated discharge consumes more than 20% of available assimilative capacity for a pollutant or exceeds the 50% cumulative cap, the regulated discharge would be required to conduct an alternatives analysis and demonstrate "important economic or social development" if allowances are sought to further reduce assimilative capacity. If such demonstrations are made, ADEQ may allow consumption of additional assimilative capacity as long as intergovernmental and public participation processes are followed and water quality standards are not violated.

Degradation is generally assumed to be significant if a discharge results in the reduction of a surface water's *assimilative capacity* for any pollutant of concern by 20 percent or more during critical flow conditions or the discharge consumes any percentage of assimilative capacity beyond 50% of the total available assimilative capacity. If the level of degradation is estimated to be less than 20 percent and the 50% cumulative cap is not exceeded– i.e., not significant – and existing uses are maintained, the antidegradation review process is complete and the applicant may proceed with permitting. Details on the antidegradation review process for waters protected under each tier – including degradation assessment, alternatives analysis, and social and economic impacts evaluation – are outlined in the following chapters. Appendix A, Antidegradation Review Flow Chart, provides an overview of the Tier 1, 2, and 3 review processes.

West Virginia (2008)

§60-5-4. Tier 1 Protection.

4.1. Existing uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.

4.2. Tier 1 protection applies to all waters of the state. A water segment shall be afforded Tier 1 protection where the level of water quality is not sufficient to support recreation and wildlife and the propagation and maintenance of fish and other aquatic life, or where the water quality meets but does not exceed levels necessary to support recreation and wildlife and the propagation and maintenance of fish and other aquatic life.

4.3. In determining whether a water segment is afforded only Tier 1 protection, the agency will focus on whether the water segment is meeting or failing to meet minimum uses.

4.4. The Secretary will consider whether a water segment is listed on the state's 303(d) impaired waters list, but where the parameter(s) for which the water segment is listed does not result in that water segment's failure to attain minimum uses and where all other parameters exceed the quality necessary to support recreation and wildlife and the propagation and maintenance of fish and other aquatic life, the water segment will be afforded Tier **2** protection. Where the parameter(s) for which the

water segment is listed does result in failure to attain minimum uses, such as **an** acid mine drainage-impacted water segment, that water segment will be afforded only Tier 1 protection.

4.5. All water segments listed on the state's 303(d) impaired waters list will be afforded only Tier 1 protection for the parameter(s) that resulted in the water segment being listed.

4.6. There also may be waters in the state where one or both of the fishable/swimmable uses are attained, but existing water quality is not "better than necessary" to support those uses (i.e., assimilative capacity does not exist for any of the parameters that would be affected by the proposed activity). Tier 1 protection is appropriate for such a water segment.

4.7. Where existing uses of the water body are impaired, there shall be no lowering of the water quality with respect to the parameters of concern that are causing the impairment. The agency shall consider nomination of such water body for the 303(d) list of water quality-impaired streams.

4.8. Where a proposed activity will result in a new or expanded discharge that would otherwise prevent attainment of an existing use in a water subject to Tier 1 protection, the applicant may be allowed to satisfy antidegradation review requirements by implementing or financing upstream controls of point or nonpoint sources sufficient to offset the water quality effects of the proposed activity from the same parameters and insure an improvement in water quality as a result of the trade. The basis of the trade will be documented and will be consistent with the trading assessment procedure that has been approved by the Secretary. A trade may be made between more than one stream segment where removing a discharge in one stream segment directly results in improved water quality in another stream segment. In addition, **(1)** the effluent trade must be for the same parameter; **(2)** where uncertainty exists regarding the effluent trade, an adequate margin of safety will be required; **(3)** dischargers cannot claim offsets for water quality improvements that are required or will occur irrespective of the proposed new or expanded discharge; and **(4)** the trade must be enforceable.